

REMARKS

The Examiner is thanked for the due consideration given the application. This amendment is being filed concurrently with a Request for Continued Examination.

Claims 1, 3-6, 9-17, 19, 20, 22 and 23 are pending in the application. Claim 7 is canceled by this amendment. Independent claim 23 is newly presented. Support for the amended claim set can be found in, e.g., Figure 2.

No new matter is believed to be added to the application by this amendment.

Rejections Under 35 USC §103(a)

Claims 1, 3-7, 9-17, 19, 20 and 22 have been rejected under 35 USC §102(b) as being anticipated by KESTEN (DE 10107895 A1, as evidenced by U.S. Publication 2008/0016884) in view of BASTIAN (U.S. Patent 5,900,538). Claim 17 has been rejected under 35 USC §103(a) as being unpatentable over KESTEN in view of BASTIAN, and further in view of LAK (U.S. Patent 5,644,920). These rejections are respectfully traversed.

The present invention pertains to a method for filling a pressure vessel of an air bag that is illustrated, by way of example, in Figure 1 of the application, which is reproduced below.

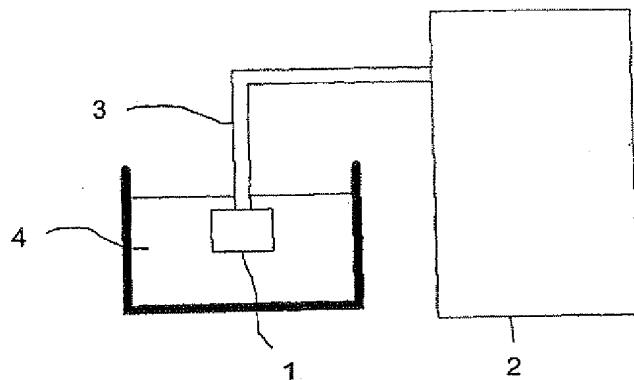


Figure 1 shows a pressure vessel 1 which is to be filled, a compressed-gas source 2, e.g., a compressed-gas cylinder (filling pressure of 300 bar) containing helium or hydrogen with shut-off valve and pressure reducer, a gas connecting conduit 3 and a refrigeration or cooling bath 4 containing a cryogenically liquefied gas, such as liquid nitrogen, as refrigerant. The pressure vessel 1 is, for example, part of a gas generator of an airbag system or a gas canister. Also, the filling quantity is determined manometrically.

The present invention is further illustrated by Figure 2 of the application, which is reproduced below.

Fig. 2

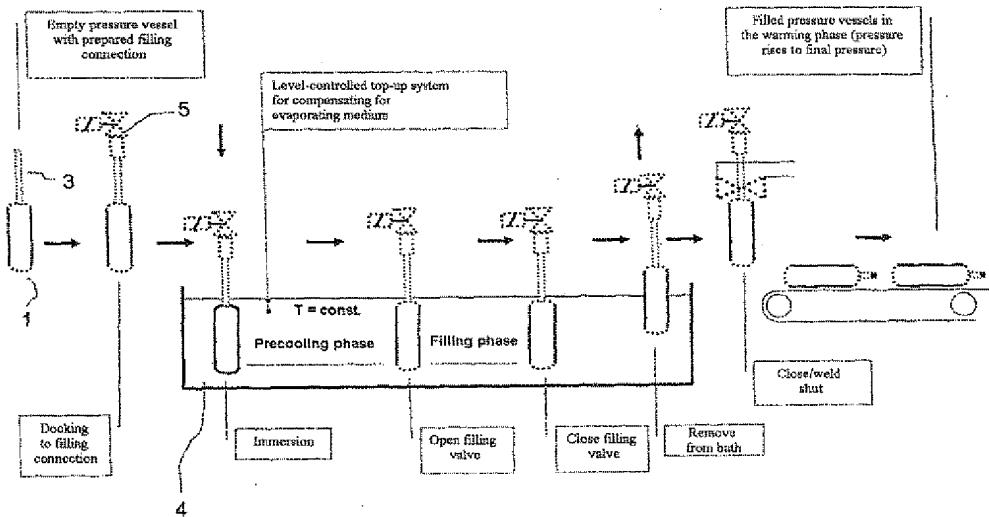


Figure 2 shows the pressure vessel moving through the cooling bath to undergo precooling and filling phases. After removal of the pressure vessel from the cooling bath, the gas is warmed or allowed to warm.

Claim 1 of the present invention recites: "cooling and filling the pressure vessel while moving through a cooling bath," and "a pressure of more than 300 bar is produced in the filled and closed pressure vessel by warming the gas or gas mixture," and "determination and monitoring of a filling quantity during the filling operation are effected manometrically." Independent claims 22 and 23 reflect these limitations.

KESTEN (as evidenced by U.S. Publication 2008/0016884) pertains to a method for filling pressure containers with gas. Figure 1 of KESTEN is reproduced below.

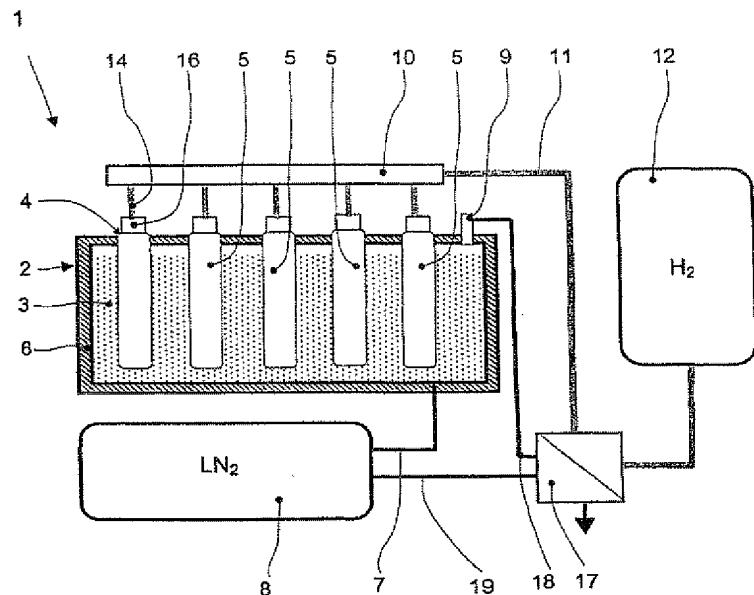


Fig. 1

Figure 1 of KESTEN shows pressure tanks 5 immersed in a coolant bath 2. However, there is no teaching or suggestion in KESTEN that the pressure tanks 5 move through the coolant bath 2 during filling. Rather, paragraph 0023 of KESTEN teaches that the pressure tanks 5 are fixed in place at the feed openings 4 of the coolant bath.

In contrast, claim 1 (and similarly independent claims 22 and 23) of the present invention recites: "cooling and filling the pressure vessel while moving through a cooling bath."

The Official Action refers to paragraphs 0002 and 0009 of KESTEN, which discuss filling a cooled pressure tank with gas and then warming to increase the internal pressure.

KESTEN fails to disclose manometric determination of filling quantity. The Official Action acknowledges this failure of KESTEN at page 5, lines 20-21.

The Official Action then refers to column 12, line 13 of BASTIAN, which states: "Actual pressure is measured by a manometric capsule". BASTIAN thus only teaches manometric pressure measurement.

BASTIAN fails to teach or suggest manometric determination of fill quantity. Nonetheless, the Official Action asserts that manometric determination of fill quantity would be obvious to one of ordinary skill in the art.

However, the production of airbag gas generators for vehicles requires a mass production at very low prices. At the same time, the system should contain an exactly defined reproducible quantity of gas and should be stable for decades.

All this was not necessary in the cited prior art, and a skilled person would fail to recognize which methods and conditions can be used for the high pressure filling of an airbag gas generator with an exactly reproducible amount of gas, especially by determining and monitoring of the filling quantity during the filling operation manometrically (monitoring the pressure), which nevertheless requires to keep all gases to be filled into the pressure vessel above the boiling temperature to avoid any measurement errors.

It should also be noted that an airbag gas generator must release the gas in case of an accident within a reproducible very short period of time, which requires certain valves (again stable for decades) that may require a filling and closing at lower pressure than the final pressure in the vessel. This can be done with the present method as the vessel is closed before warming.

There is no teaching or suggestion in the prior art, how to solve all these problems at the same time.

In the Response to Arguments the Official Action asserts: "The examiner notes that manometer is a device for measuring pressure only and that the only variable that can be directly determined manometrically is pressure." However, pressure can be measured by other devices than manometers, and the measurement of pressure does not necessarily infer manometric measurement.

One of ordinary skill and creativity would thus fail to produce claims 1 and 22 of the present invention from a knowledge of KESTEN and BASTIAN. A *prima facie* case of unpatentability has thus not been made. Claims depending upon claim 1 are patentable for at least the above reasons.

Regarding claim 17, the Official Action turns to LAK for teachings pertaining to a pressurized refrigerant used for cooling, or the temperature is set, controlled or regulated during cooling by the action of pressure. However these

teachings of LAK fail to address the deficiencies of KESTEN and BASTIAN in rendering claim 1 (from which claim 17 depends) of the present invention unpatentable. A *prima facie* case of unpatentability over claim 17 has thus not been made.

These rejections are believed to be overcome, and withdrawal thereof is respectfully requested.

Information Disclosure Statement

The Examiner is thanked for considering the Information Disclosure Statement filed April 17, 2006, and for making an initialed PTO-1449 form of record.

However, two Patent Abstracts of Japan documents have been crossed through and not initialed. For the Examiner's convenience, copies of the Patent Abstracts of Japan documents are appended to this paper.

The Examiner is accordingly respectfully requested to make a fully initialed PTO-1449 form of record in the next Official Action.

Conclusion

The rejections are believed to have been overcome, obviated, or rendered moot, and no issues remain. The Examiner is cordially respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following item(s):

- Patent Abstracts of Japan for Japan Patent Application Publication Nos. 57-200793 and 63-013999